The Claims

What is claimed as the invention is:

1. In a computer system wherein a first device and a second device through a connection over a computer network exchange a plurality of successively transmitted packets and a plurality of acknowledgment packets wherein each of said packets has a header and further wherein for a current one of said successively transmitted packets sent from an originating one of said first device and said second device and received at a receiving one of said first device and said second device said receiving one sends a respective one of said acknowledgment packets to said originating one of said first device and said second device, a stateless TCP/IP method comprising steps of:

preforming at said first device a first one of said successively transmitted packets to be transmitted to said second device wherein said header of said first one of said successively transmitted packets includes predetermined information associated with establishing said connection;

for a first one of said acknowledgment packets wherein said header of said first one of said acknowledgment packets includes complementary information associated with establishing said connection, reading selected portions of said header of said first one of said successively transmitted packets, modifying said selected portions from said first one of said successively transmitted packets and writing said selected portions from said first one of said successively transmitted packets into said header of said first one of said acknowledgment packets;

for each subsequent one of said successively transmitted packets, reading selected portions of said header of a current one of said acknowledgment packets received in acknowledgment of an immediately prior one of said successively transmitted packets, modifying said selected portions from said header of said prior

one of said acknowledgment packets and writing said selected portions from said header of said prior one of said acknowledgment packets into said header of said subsequent one of said successively transmitted packets;

for each subsequent respective one of said acknowledgment packets, reading selected portions of said header of said current one of said successively transmitted packets, modifying said selected portions from said header of said current one of said successively transmitted packets and writing said selected portions from said header of said current one of said successively transmitted packets into said header of said respective one of said acknowledgment packets;

preforming at said first device a final one of said successively transmitted packets to be transmitted to said second device wherein said header of said final one of said successively transmitted packets includes predetermined information associated with terminating said connection; and

for a final one of said acknowledgment packets wherein said header of said final one of said acknowledgment packets includes complementary information associated with terminating said connection, reading selected portions of said header of said final one of said successively transmitted packets, modifying said selected portions from said final one of said successively transmitted packets and writing said selected portions from said final one of said successively transmitted packets into said header of said final one of said acknowledgment packets.

2. A method as set forth in Claim 1 wherein said first one preforming step includes preforming a synchronization packet wherein said header of said synchronization packet includes a predetermined sequence number in a sequence number field.

3. A method as set forth in Claim 2 wherein said reading, modifying and writing step for said first one of said acknowledgment packets includes reading said

sequence number, incrementing said sequence number and subsequently writing said sequence number to an acknowledgment number field of said header of said first one of said acknowledgment packets.

4. A method as set forth in Claim 1 wherein said first one preforming step includes preforming a synchronization packet wherein said header of said synchronization packet includes a source address of said first device in a source address field and a destination address of said second device in a destination address field.

5. A method as set forth in Claim 4 wherein said reading, modifying and writing step for said first one of said acknowledgment packets includes reading each of said source address and said destination address and writing said source address to a destination address field of said header of said first one of said acknowledgment packets and writing said destination address to a source address field of said header of said first one of said acknowledgment packets.

6. A method as set forth in Claim 1 wherein said first one preforming step includes preforming a synchronization packet wherein said header of said synchronization packet includes a source port of a program executing at said first device in a source port field and a destination port of a program executing at said second device in a destination port field.

7. A method as set forth in Claim 6 wherein said reading, modifying and writing step for said first one of said acknowledgment packets includes reading each of said source port and said destination port and writing said source port to a destination port field of said header of said first one of said acknowledgment packets

and writing said destination port to a source port field of said header of said first one of said acknowledgment packets.

8. A method as set forth in Claim 1 wherein said first one preforming step includes preforming a synchronization packet wherein said header of said synchronization packet includes a checksum in a checksum field.

9. A method as set forth in Claim 8 wherein said reading, modifying and writing step for said first one of said acknowledgment packets includes reading said checksum, modifying said checksum in accordance with other modifications made to said header of said first one of said acknowledgment packets to obviate recalculation of said checksum and writing said checksum to a checksum field of said header of said first one of said acknowledgment packets.

10. A method as set forth in Claim 1 wherein said header of said current one of said acknowledgment packets received in acknowledgment of said immediately prior one of said successively transmitted packets includes an acknowledgment number in a acknowledgment number field, and wherein said reading, modifying and writing step for each subsequent one of said successively transmitted packets includes reading said acknowledgment number, developing a sequence number from said acknowledgment number and subsequently writing said sequence number to a sequence number field of said header of said subsequent one of said successively transmitted packets.

11. A method as set forth in Claim 10 wherein said developing step includes incrementing said acknowledgment number to develop said sequence number.

12. A method as set forth in Claim 1 wherein said header of said current one of said acknowledgment packets received in acknowledgment of said immediately prior one of said successively transmitted packets includes a source address of said originating one in a destination address field and a destination address of said receiving one in a source address field, and wherein said reading, modifying and writing step for each subsequent one of said successively transmitted packets includes reading each of said source address and said destination address and writing said source address to a source address field of said header of said subsequent one of said successively transmitted packets and writing said destination address to a destination address field of said header of said subsequent one of said successively transmitted packets.

13. A method as set forth in Claim 1 wherein said header of said current one of said acknowledgment packets received in acknowledgment of said immediately prior one of said successively transmitted packets includes a source port of a program executing at said originating one in a destination port field and a destination port of a program executing at said receiving one in a source port field, and wherein said reading, modifying and writing step for each subsequent one of said successively transmitted packets includes reading each of said source port and said destination port and writing said source port to a source port field of said header of said subsequent one of said successively transmitted packets and writing said destination port to a destination port field of said header of said subsequent one of said successively transmitted packets.

14. A method as set forth in Claim 1 wherein said header of said current one of said acknowledgment packets received in acknowledgment of said immediately prior one of said successively transmitted packets includes a checksum in a checksum field, and wherein said reading, modifying and writing step for each subsequent one

of said successively transmitted packets includes reading said checksum, modifying said checksum in accordance with other modifications made to said header of said subsequent one of said successively transmitted packets to obviate recalculation of said checksum and writing said checksum to a checksum field of said header of said subsequent one of said successively transmitted packets.

15. A method as set forth in Claim 1 wherein said header of said current one of said successively transmitted packets includes a sequence number in a sequence number field and a length number in a length number field, and wherein said reading, modifying and writing step for said respective one of said acknowledgment packets includes reading each of said sequence number and said length number, developing an acknowledgment number from said sequence number and said length number, and subsequently writing said acknowledgment number to an acknowledgment number field of said header of said respective one of said acknowledgment packets.

16. A method as set forth in Claim 15 wherein said developing step includes calculating said acknowledgment number as a sum of said sequence number and said length number.

17. A method as set forth in Claim 1 wherein said header of said current one of said successively transmitted packets includes a source address of said originating one in a source address field and a destination address of said receiving one in a destination address field, and wherein said reading, modifying and writing step for said respective one of said acknowledgment packets includes reading each of said source address and said destination address and writing said source address to a destination address field of said header of said respective one of said

acknowledgment packets and writing said destination address to a source address field of said header of said respective one of said acknowledgment packets.

18. A method as set forth in Claim 1 wherein said header of said current one of said successively transmitted packets includes a source port of a program executing at said originating one in a source port field and a destination port of a program executing at said receiving one in a destination port field, and wherein said reading, modifying and writing step for said respective one of said acknowledgment packets includes reading each of said source port and said destination port and writing said source port to a destination port field of said header of said respective one of said acknowledgment packets and writing said destination port to a source port field of said header of said respective one of said acknowledgment packets.

19. A method as set forth in Claim 1 wherein said header of said current one of each of said successively transmitted packets includes a checksum in a checksum field, and wherein said reading, modifying and writing step for said respective one of said acknowledgment packets includes reading said checksum, modifying said checksum in accordance with other modifications made to said header of said respective one of said acknowledgment packets to obviate recalculation of said checksum and writing said checksum to a checksum field of said header of said respective one of said acknowledgment packets.

20. A method as set forth in Claim 1 wherein said final one preforming step includes preforming a termination packet wherein said header of said termination packet includes a predetermined sequence number in a sequence number field.

21. A method as set forth in Claim 20 wherein said reading, modifying and writing step for said final one of said acknowledgment packets includes reading said

sequence number, incrementing said sequence number and subsequently writing said sequence number to an acknowledgment number field of said header of said final one of said acknowledgment packets.

22. A method as set forth in Claim 1 wherein said final one preforming step includes preforming a termination packet wherein said header of said termination packet includes a source address of said final device in a source address field and a destination address of said second device in a destination address field.

23. A method as set forth in Claim 22 wherein said reading, modifying and writing step for said final one of said acknowledgment packets includes reading each of said source address and said destination address and writing said source address to a destination address field of said header of said final one of said acknowledgment packets and writing said destination address to a source address field of said header of said final one of said acknowledgment packets.

24. A method as set forth in Claim 1 wherein said final one preforming step includes preforming a termination packet wherein said header of said termination packet includes a source port of a program executing at said final device in a source port field and a destination port of a program executing at said second device in a destination port field.

25. A method as set forth in Claim 24 wherein said reading, modifying and writing step for said final one of said acknowledgment packets includes reading each of said source port and said destination port and writing said source port to a destination port field of said header of said final one of said acknowledgment packets and writing said destination port to a source port field of said header of said final one of said acknowledgment packets.

26. A method as set forth in Claim 1 wherein said final one preforming step includes preforming a termination packet wherein said header of said termination packet includes a checksum in a checksum field.

27. A method as set forth in Claim 26 wherein said reading, modifying and writing step for said final one of said acknowledgment packets includes reading said checksum, modifying said checksum in accordance with other modifications made to said header of said final one of said acknowledgment packets to obviate recalculation of said checksum and writing said checksum to a checksum field of said header of said final one of said acknowledgment packets.

28. In a computer system wherein a program executing at a first device and a program executing at a second device exchange data in a plurality of packets transmitted bidirectionally through a connection over a computer network wherein each of said packets has a header and a payload, a stateless TCP/IP method comprising steps of:

predetermining a total first number of units of data in said payload of all of said packets to be transmitted from said first device to said second device and a total second number of units of data in said payload of all of said packets to be transmitted from said second device to said first device;

preforming a SYN packet at said first device to be transmitted to said second device as a first one of said packets wherein said header of said SYN packet includes an initial sequence number associated with said first device in a sequence number field;

preforming a FIN packet at said first device as a final one of said packets to be transmitted to said second device wherein said header of said FIN packet includes a final sequence number associated with said first device in said sequence number

field and further wherein said final sequence number is determinable from said first number of units of data;

developing at said second device a SYN/ACK packet as a further one of said packets in response to receipt of said SYN packet wherein said header of said SYN/ACK packet includes an acknowledgment number in an acknowledgment number field and an initial sequence number associated with said second device in said sequence number field and further wherein said acknowledgment number is determinable from said initial sequence number associated with said first device; and

developing at said second device a FIN/ACK packet as a final one of said packets in response to receipt of said FIN packet wherein said header of said FIN/ACK packet includes an acknowledgment number determinable from said final sequence number in said acknowledgment number field and a final sequence number associated with said second device in said sequence number field wherein said final sequence number is determinable from said second number of units of data.

29. A method as set forth in Claim 28 wherein said SYN/ACK packet developing step includes reading said initial sequence number associated with said first device upon receipt of said SYN packet, incrementing said initial sequence number associated with said first device to develop said acknowledgment number and writing said acknowledgment number to said acknowledgment number field of said header of said SYN/ACK packet.

30. A method as set forth in Claim 28 wherein said FIN/ACK packet developing step includes reading said final sequence number associated with said first device upon receipt of said FIN packet, incrementing said final sequence number associated with said first device to develop said acknowledgment number and writing said acknowledgment number to said acknowledgment number field of said header of said FIN/ACK packet.

31. A method as set forth in Claim 28 wherein said FIN packet preforming step includes determining said final sequence number of said FIN packet as a sum of said initial sequence number associated with said first device and said first number of units of data.

32. A method as set forth in Claim 28 wherein said FIN/ACK packet developing step includes determining said final sequence number of said FIN/ACK packet as a sum of said initial sequence number associated with said second device and said second number of units of data.

33. A method as set forth in Claim 28 wherein said header of said SYN packet includes a source address of said first device in a source address field and a destination address of said second device in a destination address field, and further wherein said SYN/ACK packet developing step includes reading each of said source address and said destination address from said header of said SYN packet and writing said source address to a destination address field of said header of said SYN/ACK packet and writing said destination address to a source address field of said header of said SYN/ACK packet.

34. A method as set forth in Claim 28 wherein said header of said SYN packet includes a source port of said program executing at said first device in a source port field and a destination port of said program executing at said second device in a destination port field, and further wherein said SYN/ACK packet developing step includes reading each of said source port and said destination port from said header of said SYN packet and writing said source port to a destination port field of said header of said SYN/ACK packet and writing said destination port to a source port field of said header of said SYN/ACK packet.

35. A method as set forth in Claim 28 wherein said header of said SYN packet includes a checksum in a checksum field, and further wherein said SYN/ACK packet developing step includes reading said checksum from said header of said SYN packet, modifying said checksum in accordance with other modifications made to said header of said SYN/ACK packet to obviate recalculation of said checksum and writing said checksum to a checksum field of said header of said SYN/ACK packet.

36. A method as set forth in Claim 28 wherein said header of each of said packets sent from an originating one of said first device and said second device to a receiving one of said first device and said second device includes a source address of said originating one in a source address field and a destination address of said receiving one in a destination address field, said method further comprising steps of:

developing at said receiving one of said packets as an acknowledgment packet in response to receiving a current one of said packets;

reading by said receiving one each of said source address and said destination address from said header of said current one and writing said source address to a destination address field of said header of said acknowledgment packet and writing said destination address to a source address field of said header of said acknowledgment packet.

37. A method as set forth in Claim 28 wherein said header of each of said packets sent from an originating one of said first device and said second device to a receiving one of said first device and said second device includes a source port of said program executing at said originating one in a source port field and a destination port of said program executing at said receiving one in a destination port field, said method further comprising steps of:

developing at said receiving one of said packets as an acknowledgment packet in response to receiving a current one of said packets;

reading by said receiving one each of said source port and said destination port from said header of said current one and writing said source port to a destination port field of said header of said acknowledgment packet and writing said destination port to a source port field of said header of said acknowledgment packet.

38. A method as set forth in Claim 28 wherein said header of each of said packets sent from an originating one of said first device and said second device to a receiving one of said first device and said second device includes a checksum in a checksum field, said method further comprising steps of:

developing at said receiving one of said packets as an acknowledgment packet in response to receiving a current one of said packets;

reading by said receiving one said checksum from said header of said current one, modifying said checksum in accordance with other modifications made to said header of said acknowledgment packet to obviate recalculation of said checksum and writing said checksum to a checksum field of said header of said acknowledgment packet.

39. A method as set forth in Claim 28 wherein said header of each of said packets includes a control field having an acknowledgment bit, said method further comprising the step of setting said acknowledgment bit in a current one of said packets to be sent by one of said first device and said second device to indicate acknowledgment of receipt of a prior one of said packets sent by an other one of said first device and said second device.

40. A method as set forth in Claim 39 wherein said header of each of said packets includes a sequence number field and an acknowledgment number in an acknowledgment number field, said method further comprising steps of:

reading said acknowledgment number in said header of said prior one of said packets; and

incrementing said acknowledgment number to develop a sequence number; and

writing said sequence number into said header of said current one of said packets.

41. A method as set forth in Claim 39 wherein said header of each of said packets includes an acknowledgment number field, a sequence number in a sequence number field and a length number in a length number field, said length number being a number of said units of data, said method further comprising steps of:

reading said sequence number and said length number from said current one of said packets when received at said other one of said first device and said second device;

developing an acknowledgment number from said sequence number and said length number;

writing said acknowledgment number into said acknowledgment number field of a next one of said packets developed at said other one of said first device and said second device to be sent to said one of said first device and said second device; and

setting said acknowledgment bit in said next one of said packets.

42. A method as set forth in Claim 41 wherein said acknowledgment number developing step includes calculating said acknowledgment number as a sum of said sequence number and said length number.

43. In a computer system wherein a program executing at a first device and a program executing at a second device exchange data in a plurality of first and second packets transmitted through a connection over a computer network wherein

each of said first and second packets includes a header and a payload containing units of said data, said header having a sequence number field containing a sequence number, a length field containing a length number commensurate with a number of said units contained in said payload and an acknowledgment field containing an acknowledgment number, and further wherein said first packets are successively sent from said first device to said second device and said second packets are successively sent from said second device to said first device, a stateless TCP/IP method comprising steps of:

preforming a SYN packet at said first device to be transmitted to said second device wherein said SYN packet includes a header having a sequence number field and an initial sequence number associated with said first device in said sequence number field;

developing at said second device in response to receipt of said SYN packet a SYN/ACK packet to be transmitted to said first device wherein said SYN/ACK packet includes a header having an acknowledgment number field, an acknowledgment number in an acknowledgment number field, a sequence number field and an initial sequence number associated with said second device in said sequence number field and further wherein said acknowledgment number is determinable from said initial sequence number associated with said first device;

for each current one of said first packets to be sent, reading said sequence number, said length number and said acknowledgment number from said header of a respective one of said second packets received at said first device subsequently to an immediately prior one of said first packets being sent, developing for said current one of said first packets each of a current acknowledgment number from said sequence number and said length number from said header of said respective one of said second packets and a current sequence number from said acknowledgment number of said respective one of said second packets, and writing said current acknowledgment number and said current sequence number to said acknowledgment

number field and said sequence number field, respectively, of said header of said current one of said first packets;

for each current one of said second packets to be sent, reading said sequence number, said length number and said acknowledgment number from said header of a respective one of said first packets received at said second device subsequently to an immediately prior one of said second packets being sent, developing for said current one of said second packets each of a current acknowledgment number from said sequence number and said length number from said header of said respective one of said first packets and a current sequence number from said acknowledgment number of said respective one of said first packets, and writing said current acknowledgment number for said current one of said second packets and said current sequence number for said current one of said second packets to said acknowledgment number field and said sequence number field, respectively, of said header of said current one of said second packets;

preforming a FIN packet at said first device as a final one of said packets to be transmitted to said second device wherein said header of said FIN packet includes a final sequence number associated with said first device in said sequence number field and further wherein said final sequence number is determinable from said first number of units of data;

developing at said second device a FIN/ACK packet as a final one of said packets in response to receipt of said FIN packet wherein said header of said FIN/ACK includes an acknowledgment number determinable from said final sequence number in said acknowledgment number field and a final sequence number associated with said second device in said sequence number field wherein said final sequence number is determinable from said second number of units of data.

44. A method as set forth in Claim 43 wherein said SYN/ACK packet developing step includes reading said initial sequence number associated with said

first device upon receipt of said SYN packet, incrementing said initial sequence number associated with said first device to develop said acknowledgment number and writing said acknowledgment number to said acknowledgment number field of said header of said SYN/ACK packet.

45. A method as set forth in Claim 43 wherein said FIN/ACK packet developing step includes reading said final sequence number associated with said first device upon receipt of said FIN packet, incrementing said final sequence number associated with said first device to develop said acknowledgment number and writing said acknowledgment number to said acknowledgment number field of said header of said FIN/ACK packet.

46. A method as set forth in Claim 43 wherein said FIN packet preforming step includes determining said final sequence number of said FIN packet as a sum of said initial sequence number associated with said first device and said first number of units of data.

47. A method as set forth in Claim 43 wherein said FIN/ACK packet developing step includes determining said final sequence number of said FIN/ACK packet as a sum of said initial sequence number associated with said second device and said second number of units of data.

48. A method as set forth in Claim 43 wherein said header of said SYN packet includes a source address of said first device in a source address field and a destination address of said second device in a destination address field, and further wherein said SYN/ACK packet developing step includes reading each of said source address and said destination address from said header of said SYN packet and writing said source address to a destination address field of said header of said SYN/ACK

packet and writing said destination address to a source address field of said header of said SYN/ACK packet.

49. A method as set forth in Claim 43 wherein said header of said SYN packet includes a source port of said program executing at said first device in a source port field and a destination port of said program executing at said second device in a destination port field, and further wherein said SYN/ACK packet developing step includes reading each of said source port and said destination port from said header of said SYN packet and writing said source port to a destination port field of said header of said SYN/ACK packet and writing said destination port to a source port field of said header of said SYN/ACK packet.

50. A method as set forth in Claim 43 wherein said header of said SYN packet includes a checksum in a checksum field, and further wherein said SYN/ACK packet developing step includes reading said checksum from said header of said SYN packet, modifying said checksum in accordance with other modifications made to said header of said SYN/ACK packet to obviate recalculation of said checksum and writing said checksum to a checksum field of said header of said SYN/ACK packet.

51. A method as set forth in Claim 43 wherein said header of said respective one of said second packets includes a source address of said second device in a source address field and a destination address of said first device in a destination address field, said method further comprising steps of:

developing at said first device said current one of said first packets in response to receiving said respective one of said second packets;

reading by said first device each of said source address and said destination address from said header of said respective one of said second packets and writing said source address to a destination address field of said header of said current one

of said first packets and writing said destination address to a source address field of said header of said current one of said first packets.

52. A method as set forth in Claim 43 wherein said header of said respective one of said second packets includes a source port of said program executing at said second device in a source port field and a destination port of said program executing at said first device in a destination port field, said method further comprising steps of:

developing at said first device said current one of said first packets in response to receiving said respective one of said second packets;

reading by said first device each of said source port and said destination port from said header of said respective one of said second packets and writing said source port to a destination port field of said header of said current one of said first packets and writing said destination port to a source port field of said header of said current one of said first packets.

53. A method as set forth in Claim 43 wherein said header of said respective one of said second packets includes a checksum in a checksum field, said method further comprising steps of:

developing at said first device said current one of said first packets in response to receiving said respective one of said second packets;

reading by said first device said checksum from said header of said respective one of said second packets and writing said checksum to a checksum field of said header of said current one of said first packets.

54. A method as set forth in Claim 43 wherein said header of said current one of said first packets includes a control field having an acknowledgment bit, said method further comprising the step of setting said acknowledgment bit in said current

one of said first packets to indicate acknowledgment of receipt of said respective one of said second packets.

55. A method as set forth in Claim 54 wherein said setting step occurs substantially contemporaneously with said current acknowledgment number writing step.

56. A method as set forth in Claim 54 wherein said current sequence number for said current one of said first packets developing step includes the step of incrementing said acknowledgment number from said respective one of said second packets.

57. A method as set forth in Claim 56 wherein said current acknowledgment number for said current one of said first packets developing step includes calculating said acknowledgment number for said current one of said first packets as a sum of said sequence number and said length number from said header of said respective one of said second packets.

58. A method as set forth in Claim 43 wherein said header of said respective one of said first packets includes a source address of said first device in a source address field and a destination address of said second device in a destination address field, said method further comprising steps of:

developing at said second device said current one of said second packets in response to receiving said respective one of said first packets;

reading by said second device each of said source address and said destination address from said header of said respective one of said first packets and writing said source address to a destination address field of said header of said current one of said

second packets and writing said destination address to a source address field of said header of said current one of said second packets.

59. A method as set forth in Claim 43 wherein said header of said respective one of said first packets includes a source port of said program executing at said first device in a source port field and a destination port of said program executing at said second device in a destination port field, said method further comprising steps of:

developing at said second device said current one of said second packets in response to receiving said respective one of said first packets;

reading by said second device each of said source port and said destination port from said header of said respective one of said first packets and writing said source port to a destination port field of said header of said current one of said second packets and writing said destination port to a source port field of said header of said current one of said second packets.

60. A method as set forth in Claim 43 wherein said header of said respective one of said first packets includes a checksum in a checksum field, said method further comprising steps of:

developing at said second device said current one of said second packets in response to receiving said respective one of said first packets;

reading by said second device said checksum from said header of said respective one of said first packets and writing said checksum to a checksum field of said header of said current one of said second packets.

61. A method as set forth in Claim 43 wherein said header of said current one of said second packets includes a control field having an acknowledgment bit, said method further comprising the step of setting said acknowledgment bit in said

current one of said second packets to indicate acknowledgment of receipt of said respective one of said first packets.

62. A method as set forth in Claim 61 wherein said setting step occurs substantially contemporaneously with said current acknowledgment number writing step.

63. A method as set forth in Claim 61 wherein said current sequence number for said current one of said second packets developing step includes the step of incrementing said acknowledgment number from said respective one of said first packets.

64. A method as set forth in Claim 63 wherein said current acknowledgment number for said current one of said second packets developing step includes calculating said acknowledgment number for said current one of said second packets as a sum of said sequence number and said length number from said header of said respective one of said first packets.

65. In a computer system wherein a first device and a second device through a connection over a computer network exchange a plurality of successively transmitted packets and a plurality of acknowledgment packets wherein each of said packets has a header and further wherein for a current one of said successively transmitted packets sent from an originating one of said first device and said second device and received at a receiving one of said first device and said second device said receiving one sends a respective one of acknowledgment packets to said originating one of said first device and said second device, a stateless TCP/IP apparatus comprising:

a first one of said successively transmitted packets being preformed at said first device to be transmitted to said second device, said header of said first one of said successively transmitted packets including predetermined information associated with establishing said connection;

a first one of said acknowledgment packets being developed at said second device in response to receipt of said first one of said successively transmitted packets said second device reads selected portions of said header of said first one of said successively transmitted packets, modifies said selected portions from said first one of said successively transmitted packets and writes said selected portions from said first one of said successively transmitted packets into said header of said first one of said acknowledgment packets, said header of said first one of said acknowledgment packets including complementary information associated with establishing said connection;

for each subsequent one of said successively transmitted packets sent by said originating one, said originating one reads selected portions of said header of a current one of said acknowledgment packets received in acknowledgment of an immediately prior one of said successively transmitted packets, modifies said selected portions from said header of said prior one of said acknowledgment packets and writes said selected portions from said header of said prior one into said header of said subsequent one of said successively transmitted packets;

for each subsequent respective one of said acknowledgment packets, said receiving one reads selected portions of said header of said current one of said successively transmitted packets, modifies said selected portions of said header from said current one of said successively transmitted packets and writes said selected portions of said header from said current one of said successively transmitted packets into said header of said respective one of said acknowledgment packets;

a final one of said successively transmitted packets being preformed at said first device to be transmitted to said second device, said header of said final one of

said packets including predetermined information associated with terminating said connection; and

a final one of said acknowledgment packets being developed at said second device in response to receipt of said final one of said successively transmitted packets, said header of said final one of said acknowledgment packets including complementary information associated with terminating said connection, said second device reads selected portions of said header of said final one of said successively transmitted packets, modifies said selected portions from said final one of said successively transmitted packets and writes said selected portions from said final one of said successively transmitted packets into said header of said final one of said acknowledgment packets.

66. An apparatus as set forth in Claim 65 wherein said first one of said successively transmitted packets includes a synchronization packet having a header, said header of said synchronization packet including a sequence number field containing a sequence number.

67. An apparatus as set forth in Claim 66 wherein said header of said first one of said acknowledgment packets includes an acknowledgment number field, said second device reads said sequence number, increments said sequence number and subsequently writes said sequence number to said acknowledgment number field of said header of said first one of said acknowledgment packets.

68. An apparatus as set forth in Claim 65 wherein said first one of said successively transmitted packets includes a synchronization packet having a header, said header of said synchronization packet including a source address field containing a source address of said first device and a destination address field containing a destination address of said first device.

69. An apparatus as set forth in Claim 68 wherein said header of a source address field and a destination address field, said second device reads said first one of said acknowledgment packets includes reading each of said source address and said destination address and writes said source address to said destination address field of said header of said first one of said acknowledgment packets and writes said destination address to said source address field of said header of said first one of said acknowledgment packets.

70. An apparatus as set forth in Claim 65 wherein said first one of said successively transmitted packets includes a synchronization packet having a header, said header of said synchronization packet including a source port field containing a source port of a program executing at said first device and a destination port field containing a destination port of a program executing at said second device.

71. An apparatus as set forth in Claim 70 wherein said header of said first one of said acknowledgment packets includes a source port field and a destination port field, said second device reads each of said source port and said destination port and writes said source port to said destination port field of said header of said first one of said acknowledgment packets and writes said destination port to said source port field of said header of said first one of said acknowledgment packets.

72. An apparatus as set forth in Claim 65 wherein said first one of said successively transmitted packets includes a synchronization packet having a header, said header of said synchronization packet includes a checksum field containing a checksum.

73. An apparatus as set forth in Claim 72 wherein said header of said first one of said acknowledgment packets includes a checksum field, said second device

reads said checksum, modifying said checksum in accordance with other modifications made to said header of said first one of said acknowledgment packets to obviate recalculation of said checksum and writes said checksum to said checksum field of said header of said first one of said acknowledgment packets.

74. An apparatus as set forth in Claim 65 wherein said header of said current one of said acknowledgment packets received in acknowledgment of said immediately prior one of said successively transmitted packets includes an acknowledgment number field containing an acknowledgment number, and said header of each subsequent one of said successively transmitted packets includes a sequence number field, said originating one reads said acknowledgment number, develops a sequence number from said acknowledgment number and writes said sequence number to said sequence number field of said header of said subsequent one of said successively transmitted packets.

75. An apparatus as set forth in Claim 74 wherein said originating one increments said acknowledgment number to develop said sequence number.

76. An apparatus as set forth in Claim 65 wherein said header of said current one of said acknowledgment packets received in acknowledgment of said immediately prior one of said successively transmitted packets includes a destination address field containing a source address of said originating one and a source address field containing a destination address of said receiving one and said header of each subsequent one of said successively transmitted packets includes a source address field and a destination address field, said originating one reads each of said source address and said destination address and writes said source address to said destination address field of said header of said subsequent one of said successively transmitted packets.

77. An apparatus as set forth in Claim 65 wherein said header of said current one of said acknowledgment packets received in acknowledgment of said immediately prior one of said successively transmitted packets includes a destination port field containing a source port of a program executing at said originating one and a destination port of a program executing at said receiving one a source port field containing, and said header of each subsequent one of said successively transmitted packets includes a source port field and a destination port field, said originating one read each of said source port and said destination port and writes said source port to said source port field of said header of said subsequent one of said successively transmitted packets and writes said destination port to said destination port field of said header of said subsequent one of said successively transmitted packets.

78. An apparatus as set forth in Claim 65 wherein said header of said current one of said acknowledgment packets received in acknowledgment of said immediately prior one of said successively transmitted packets includes a checksum field containing a checksum, and wherein said header of each subsequent one of said successively transmitted packets includes a checksum field, said originating one reads said checksum, modifies said checksum in accordance with other modifications made to said header of said subsequent one of said successively transmitted packets to obviate recalculation of said checksum and writes said checksum to said checksum field of said header of said subsequent one of said successively transmitted packets.

79. An apparatus as set forth in Claim 65 wherein said header of said current one of said successively transmitted packets includes a sequence number field containing a sequence number and a length number field containing a length number, and said header of said respective one of said acknowledgment packets includes an acknowledgment number field, said receiving one reads each of said sequence number and said length number, develops an acknowledgment number from said sequence

number and said length number, and writes said acknowledgment number to said acknowledgment number field of said header of said respective one of said acknowledgment packets.

80. An apparatus as set forth in Claim 79 wherein said receiving one calculates said acknowledgment number as a sum of said sequence number and said length number.

81. An apparatus as set forth in Claim 65 wherein said header of said current one of said successively transmitted packets includes a source address field containing said source address of said originating one and a destination address field containing said destination address of said receiving one and said header for said respective one of said acknowledgment packets includes a source address field and a destination address field, said receiving one reads each of said source address and said destination address and writes said source address to said destination address field of said header of said respective one of said acknowledgment packets and writes said destination address to said source address field of said header of said respective one of said acknowledgment packets.

82. An apparatus as set forth in Claim 65 wherein said header of said current one of said successively transmitted packets includes a source port field containing a source port of a program executing at said originating one and a destination port field containing a destination port of a program executing at said receiving one and wherein said reading, modifying and writing step for said respective one of said acknowledgment packets includes reading each of said source port and said destination port and writing said source port to said destination port field of said header of said respective one of said acknowledgment packets and

writing said destination port to said source port field of said header of said respective one of said acknowledgment packets.

83. An apparatus as set forth in Claim 65 wherein said header of said current one of said successively transmitted packets includes a checksum field containing a checksum, and said header of said respective one of said acknowledgment packets includes a checksum field, said receiving one reads said checksum, modifies said checksum in accordance with other modifications made to said header of said respective one of said acknowledgment packets to obviate recalculation of said checksum and writes said checksum to said checksum field of said header of said respective one of said acknowledgment packets.

84. An apparatus as set forth in Claim 65 wherein said final one preforming step includes preforming a termination packet wherein said header of said termination packet includes a predetermined sequence number in a sequence number field.

85. An apparatus as set forth in Claim 84 wherein said reading, modifying and writing step for said final one of said acknowledgment packets includes reading said sequence number, incrementing said sequence number and subsequently writing said sequence number to an acknowledgment number field of said header of said final one of said acknowledgment packets.

86. An apparatus as set forth in Claim 65 wherein said final one preforming step includes preforming a termination packet wherein said header of said termination packet includes a source address of said final device in a source address field and a destination address of said second device in a destination address field.

87. An apparatus as set forth in Claim 86 wherein said reading, modifying and writing step for said final one of said acknowledgment packets includes reading each of said source address and said destination address and writing said source address to a destination address field of said header of said final one of said acknowledgment packets and writing said destination address to a source address field of said header of said final one of said acknowledgment packets.

88. An apparatus as set forth in Claim 65 wherein said final one preforming step includes preforming a termination packet wherein said header of said termination packet includes a source port of a program executing at said final device in a source port field and a destination port of a program executing at said second device in a destination port field.

89. An apparatus as set forth in Claim 88 wherein said reading, modifying and writing step for said final one of said acknowledgment packets includes reading each of said source port and said destination port and writing said source port to a destination port field of said header of said final one of said acknowledgment packets and writing said destination port to a source port field of said header of said final one of said acknowledgment packets.

90. An apparatus as set forth in Claim 65 wherein said final one preforming step includes preforming a termination packet wherein said header of said termination packet includes a checksum in a checksum field.

91. An apparatus as set forth in Claim 90 wherein said reading, modifying and writing step for said final one of said acknowledgment packets includes reading said checksum, modifying said checksum in accordance with other modifications made to said header of said final one of said acknowledgment packets to obviate

recalculation of said checksum and writing said checksum to a checksum field of said header of said final one of said acknowledgment packets.

92. In a computer system wherein a program executing at a first device and a program executing at a second device exchange data in a plurality of packets transmitted bidirectionally through a connection over a computer network and further wherein each of said packets has a header and a payload, a stateless TCP/IP apparatus comprising:

a predetermined total first number of units of data in said payload of all of said packets to be transmitted from said first device to said second device and a predetermined total second number of units of data in said payload of all of said packets to be transmitted from said second device to said first device;

a SYN packet preformed at said first device to be transmitted to said second device as a first one of said packets, said SYN packet including a header having a sequence number field containing an initial sequence number associated with said first device;

a FIN packet preformed at said first device as a final one of said packets to be transmitted to said second device, said FIN packet including a header having a sequence number field containing a final sequence number associated with said first device, said final sequence number being determinable from said first number of units of data;

a SYN/ACK packet, said SYN/ACK packet including a header having an acknowledgment number field and a sequence number field, said acknowledgment number field containing an acknowledgment number determinable from said initial sequence number in said sequence number field of said CYN packet, said sequence number field of said SYN/ACK packet having an initial sequence number associated with said device developed at said second device to be transmitted to said first device; and

a FIN/ACK packet, said FIN/ACK packet including a header having as a final one of said packets in response to receipt of said FIN packet an acknowledgment number field and a sequence number field, said acknowledgment number field containing an acknowledgment number determinable from said final sequence number in said sequence number field of said FIN packet, said sequence number field of said FIN/ACK packet containing a sequence number determinable from said second number of units of data.

93. An apparatus as set forth in Claim 92 wherein said second device reads said initial sequence number associated with said first device upon receipt of said SYN packet, increments said initial sequence number associated with said first device to develop said acknowledgment number for said header of said SYN/ACK packet and writes said acknowledgment number for said header of said SYN/ACK packet to said acknowledgment number field of said header of said SYN/ACK packet.

94. An apparatus as set forth in Claim 92 wherein second device to develop said FIN/ACK packet reads said final sequence number associated with said first device upon receipt of said FIN packet, increments said final sequence number associated with said first device to develop said acknowledgment number for said header of said FIN/ACK packet and writes said acknowledgment number for said header of said FIN/ACK packet to said acknowledgment number field of said header of said FIN/ACK packet.

95. An apparatus as set forth in Claim 92 wherein said first device determines said final sequence number of said FIN packet as a sum of said initial sequence number associated with said first device and said first number of units of data.

96. An apparatus as set forth in Claim 92 wherein said second device determines said final sequence number of said FIN/ACK packet as a sum of said initial sequence number associated with said second device and said second number of units of data.

97. An apparatus as set forth in Claim 92 wherein said header of said SYN packet includes a source address of said first device in a source address field and a destination address of said second device in a destination address field, and further wherein said header of said SYN/ACK packet includes a source address field and a destination address field, said second device reads each of said source address and said destination address from said header of said SYN packet and writing said source address to said destination address field of said header of said SYN/ACK packet and writes said destination address to said source address field of said header of said SYN/ACK packet.

98. An apparatus as set forth in Claim 92 wherein said header of said SYN packet includes a source port of said program executing at said first device in a source port field and a destination port of said program executing at said second device in a destination port field, and further wherein said headers said SYN/ACK packet includes a source port field and a destination port field, said second device reads each of said source port and said destination port from said header of said SYN packet and writes said source port to said destination port field of said header of said SYN/ACK packet and writing said destination port to said source port field of said header of said SYN/ACK packet.

99. An apparatus as set forth in Claim 92 wherein said header of said SYN packet includes a checksum in a checksum field, and further wherein said header of said SYN/ACK packet includes a checksum field, said second device reads said

checksum from said header of said SYN packet, modifies said checksum in accordance with other modifications made to said header of said SYN/ACK packet to obviate recalculation of said checksum and writes said checksum to said checksum field of said header of said SYN/ACK packet.

100. An apparatus as set forth in Claim 92 wherein said header of each of said packets sent from an originating one of said first device and said second device to a receiving one of said first device and said second device includes a source address of said originating one in a source address field and a destination address of said receiving one in a destination address field, said apparatus further comprising:

an acknowledgment packet including a header having a source address field and a destination address field developed at said receiving one in response to receiving a current one of said packets from said originating one;

wherein by said receiving one reads each of said source address and said destination address from said header of said current one and writes said source address to said destination address field of said header of said acknowledgment packet and writes said destination address to said source address field of said header of said acknowledgment packet.

101. An apparatus as set forth in Claim 92 wherein said header of each of said packets sent from an originating one of said first device and said second device to a receiving one of said first device and said second device includes a source port of said program executing at said originating one in a source port field and a destination port of said program executing at said receiving one in a destination port field, said apparatus further comprising:

an acknowledgment packet including a header having a source port field and a destination port field developed at said receiving one in response to receiving a current one of said packets from said originating one;

wherein said receiving one reads each of said source port and said destination port from said header of said current one and writes said source port to said destination port field of said header of said acknowledgment packet and writes said destination port to said source port field of said header of said acknowledgment packet.

102. An apparatus as set forth in Claim 92 wherein said header of each of said packets sent from an originating one of said first device and said second device to a receiving one of said first device and said second device includes a checksum in a checksum field, said apparatus further comprising:

an acknowledgment packet including a header having a checksum field developed at said receiving one in response to receiving a current one of said packets from said originating one;

wherein said receiving one reads said checksum from said header of said current one, modifies said checksum in accordance with other modifications made to said header of said acknowledgment packet to obviate recalculation of said checksum and writes said checksum to said checksum field of said header of said acknowledgment packet.

103. An apparatus as set forth in Claim 92 wherein said header of each of said packets includes a control field having an acknowledgment bit, said acknowledgment bit in a current one of said packets to be sent by one of said first device and said second device being set to indicate acknowledgment of receipt of a prior one of said packets sent by an other one of said first device and said second device.

104. An apparatus as set forth in Claim 103 wherein said header of each of said packets includes a sequence number field and an acknowledgment number in an

acknowledgment number field, said one of said first device and said second device reads said acknowledgment number in said header of said prior one of said packets, increments said acknowledgment number to develop a current sequence number, and writes said sequence number into said header of said current one of said packets.

105. An apparatus as set forth in Claim 103 wherein said header of each of said packets includes an acknowledgment number field, a sequence number in a sequence number field and a length number in a length number field, said length number being a number of said units of data, said other one of said first device and said second device reads said sequence number and said length number from said current one of said packets, develops an acknowledgment number from said sequence number and said length number, writes said acknowledgment number into said acknowledgment number field of a next one of said packets developed at said other one of said first device and said second device to be sent to said one of said first device and sets said acknowledgment bit in said next one of said packets.

106. An apparatus as set forth in Claim 105 wherein said acknowledgment number is calculated as a sum of said sequence number and said length number.

107. In a computer system wherein a program executing at a first device and a program executing at a second device exchange data in a plurality of packets transmitted bidirectionally through a connection over a computer network wherein each of said packets includes a header and a payload containing units of said data, said header having a sequence number field containing a sequence number, a length field containing a length number commensurate with a number of said units contained in said payload and an acknowledgment field containing an acknowledgment number, and further wherein first successive ones of said packets are sent from said first device to

said second device and second successive ones of said packets are sent from said second device to said first device, a stateless TCP/IP apparatus comprising:

a SYN packet preformed at said first device to be transmitted to said second device, said SYN packet including a header having a sequence number field and an initial sequence number associated with said first device in said sequence number field;

a SYN/ACK packet developed at said second device in response to receipt of said SYN packet to be transmitted to said first device, said SYN/ACK packet including a header having an acknowledgment number field, an acknowledgment number in said acknowledgment number field, a sequence number field and an initial sequence number associated with said second device in said sequence number field, said acknowledgment number being determinable from said initial sequence number associated with said first device;

for each current one of said first packets to be sent, said first device said sequence number, said length number and said acknowledgment number from said header of a respective one of said second packets received at said first device subsequently to an immediately prior one of said first packets being sent, develops for said current one of said first packets each of a current acknowledgment number from said sequence number and said length number from said header of said respective one of said second packets and a current sequence number from said acknowledgment number of said respective one of said second packets, and writes said current acknowledgment number and said current sequence number to said acknowledgment number field and said sequence number field, respectively, of said header of said current one of said first packets;

for each current one of said second packets to be sent, said second device reads said sequence number, said length number and said acknowledgment number from said header of a respective one of said first packets received at said second device subsequently to an immediately prior one of said second packets being sent, develops for said current one of said second packets each of a current acknowledgment number

from said sequence number and said length number from said header of said respective one of said first packets and a current sequence number from said acknowledgment number of said respective one of said first packets, and writes said current acknowledgment number for said current one of said second packets and said current sequence number for said current one of said second packets to said acknowledgment number field and said sequence number field, respectively, of said header of said current one of said second packets;

a FIN packet preformed at said first device as a final one of said packets to be transmitted to said second device, said FIN packet including a header having a sequence number field and a final sequence number associated with said first device in said sequence number field, said final sequence number being determinable from said initial sequence number associated with said first device and said first number of units of data; and

a FIN/ACK packet developed at said second device in response to receipt of said FIN packet, said FIN/ACK including an acknowledgment number field and a sequence number field, said acknowledgment number field having an acknowledgment number determinable from said final sequence number and said sequence number field having a final sequence number associated with said second device, said final sequence number being determinable from said initial sequence number associated with said second device and said second number of units of data.

108. An apparatus as set forth in Claim 107 wherein said second device reads said initial sequence number associated with said first device upon receipt of said SYN packet, increments said initial sequence number associated with said first device to develop said acknowledgment number and writes said acknowledgment number to said acknowledgment number field of said header of said SYN/ACK packet.

109. An apparatus as set forth in Claim 107 wherein said second device reads said final sequence number associated with said first device upon receipt of said FIN packet, increments said final sequence number associated with said first device to develop said acknowledgment number and writes said acknowledgment number to said acknowledgment number field of said header of said FIN/ACK packet.

110. An apparatus as set forth in Claim 107 wherein said final sequence number of said FIN packet is determined as a sum of said initial sequence number associated with said first device and said first number of units of data.

111. An apparatus as set forth in Claim 107 wherein said final sequence number of said FIN/ACK packet is determined as a sum of said initial sequence number associated with said second device and said second number of units of data.

112. An apparatus as set forth in Claim 107 wherein said header of said SYN packet includes a source address of said first device in a source address field and a destination address of said second device in a destination address field, and further wherein said header of said SYN/ACK packet includes a source address field and a destination address field, said second device reads each of said source address and said destination address from said header of said SYN packet and writes said source address to said destination address field of said header of said SYN/ACK packet and writes said destination address to said source address field of said header of said SYN/ACK packet.

113. An apparatus as set forth in Claim 107 wherein said header of said SYN packet includes a source port of said program executing at said first device in a source port field and a destination port of said program executing at said second device in a destination port field, and further wherein said header of said SYN/ACK packet

includes a source port field and a destination port field, said second device reads each of said source port and said destination port from said header of said SYN packet and writes said source port to said destination port field of said header of said SYN/ACK packet and writes said destination port to said source port field of said header of said SYN/ACK packet.

114. An apparatus as set forth in Claim 107 wherein said header of said SYN packet includes a checksum in a checksum field, and further wherein said header of said SYN/ACK packet includes a checksum field, said second device reads said checksum from said header of said SYN packet, modifies said checksum in accordance with other modifications made to said header of said SYN/ACK packet to obviate recalculation of said checksum and writes said checksum to said checksum field of said header of said SYN/ACK packet.

115. An apparatus as set forth in Claim 107 wherein said header of said respective one of said second packets includes a source address of said second device in a source address field and a destination address of said first device in a destination address field, said current one of said first packets being developed at said first device in response to receiving said respective one of said second packets, wherein said first device reads each of said source address and said destination address from said header of said respective one of said second packets and writes said source address to a destination address field of said header of said current one of said first packets and writing said destination address to a source address field of said header of said current one of said first packets.

116. An apparatus as set forth in Claim 107 wherein said header of said respective one of said second packets includes a source port of said program executing at said second device in a source port field and a destination port of said program

executing at said first device in a destination port field, said current one of said first packets being developed at said first device in response to receiving said respective one of said second packets, wherein said first device reads each of said source port and said destination port from said header of said respective one of said second packets and writes said source port to a destination port field of said header of said current one of said first packets and writes said destination port to a source port field of said header of said current one of said first packets.

117. An apparatus as set forth in Claim 107 wherein said header of said respective one of said second packets includes a checksum in a checksum field, said current one of said first packets being developed at said first device in response to receiving said respective one of said second packets, wherein said first device reads said checksum from said header of said respective one of said second packets and writes said checksum to a checksum field of said header of said current one of said first packets.

118. An apparatus as set forth in Claim 107 wherein said header of said current one of said first packets includes a control field having an acknowledgment bit, said acknowledgment bit being set in said current one of said first packets to indicate acknowledgment of receipt of said respective one of said second packets.

119. An apparatus as set forth in Claim 118 wherein said acknowledgment bit is set substantially contemporaneously with said current acknowledgment number being written.

120. An apparatus as set forth in Claim 118 wherein said current sequence number for said current one of said first packets is developed by incrementing said acknowledgment number from said respective one of said second packets.

121. An apparatus as set forth in Claim 120 wherein said current acknowledgment number for said current one of said first packets is calculated as a sum of said sequence number and said length number from said header of said respective one of said second packets.

122. An apparatus as set forth in Claim 107 wherein said header of said respective one of said first packets includes a source address of said first device in a source address field and a destination address of said second device in a destination address field, said current one of said second packets being developed at said second device in response to receiving said respective one of said first packets, wherein said second device reads each of said source address and said destination address from said header of said respective one of said first packets and writes said source address to a destination address field of said header of said current one of said second packets and writes said destination address to a source address field of said header of said current one of said second packets.

123. An apparatus as set forth in Claim 107 wherein said header of said respective one of said first packets includes a source port of said program executing at said first device in a source port field and a destination port of said program executing at said second device in a destination port field, said current one of said second packets being developed at said second device in response to receiving said respective one of said first packets, wherein said second device reads each of said source port and said destination port from said header of said respective one of said first packets and writes said source port to a destination port field of said header of said current one of said second packets and writes said destination port to a source port field of said header of said current one of said second packets.

124. An apparatus as set forth in Claim 107 wherein said header of said respective one of said first packets includes a checksum in a checksum field, said current one of said second packets being developed at said second device in response to receiving said respective one of said first packets, wherein said second device reads said checksum from said header of said respective one of said first packets and writes said checksum to a checksum field of said header of said current one of said second packets.

125. An apparatus as set forth in Claim 107 wherein said header of said current one of said second packets includes a control field having an acknowledgment bit, said acknowledgment bit being set in said current one of said second packets to indicate acknowledgment of receipt of said respective one of said first packets.

126. An apparatus as set forth in Claim 125 wherein said acknowledgment bit is set substantially contemporaneously with said current acknowledgment number being written.

127. An apparatus as set forth in Claim 125 wherein said current sequence number for said current one of said second packets is developed by incrementing said acknowledgment number from said respective one of said first packets.

128. An apparatus as set forth in Claim 127 wherein said current acknowledgment number for said current one of said second packets is calculated as a sum of said sequence number and said length number from said header of said respective one of said first packets.